

Monterey Bay National Marine Sanctuary

Understanding the Impacts of Plane and Ship Groundings and Sinkings

Management Issue

Monterey Bay National Marine Sanctuary (MBNMS or Sanctuary) management needs to be able to understand the long-term ecological effects of plane and ship groundings and sinkings.

Description

Despite the use of modern navigation aids and safety protocols, major accidents still occasionally befall ships and planes operating above, within, and adjacent to MBNMS. In the case of aircraft or vessels that become grounded or sink to the seafloor in known and accessible locations, after rescue operations are concluded there is usually an initial effort to assess damage to Sanctuary habitats and living resources. These efforts have included reports of immediate impacts such as fuel discharged, as well as acute impacts on biology and geology. Qualitative observations have been complemented by quantitative transects to measure the relative abundances of species occupying the disturbed site, adjacent areas, and nearby undisturbed reference areas. Characterization studies of surrounding areas of the MBNMS can be used to describe the types of habitat that are likely to be impacted, and have been referenced in damage assessments. Additional research is needed on the long-term effects that plane and ship groundings and sinkings may have on habitat and biological communities. Long-term monitoring would provide a more complete picture of the ability of affected areas to recover from disturbance, and would also provide information on the timescales at which unrecovered vessels break down and shift location. More extensive follow-up monitoring would also allow managers to communicate persistent hazards affecting other human uses that may persist.



F/V Lou Denny Wayne grounding, approximately 1.4 miles SE of Pigeon Point, California. The vessel grounded on November 29, 2007, and this photo was taken on December 3, 2007. Photo credit: MBNMS.

Questions and Information Needs

- 1) When aircraft and vessels remain at the sites where they are lost, what is the duration and extent of non-structural effects (such as fluid residuals slowly leaking and chemicals leaching out of systems/cables)?
- 2) How long does it take for abandoned vessels to break up and disappear?
- 3) When aircraft and vessels are removed from the sites where they are lost, does the disturbed habitat return to a state similar to adjoining habitats not affected by the disturbance?
- 4) Are recovery rates different for physical damage vs. damage from oil/diesel?
- 5) At what time scales does recovery of habitat and biological communities occur?
- 6) What are the general sampling methods employed during initial and subsequent visits to an aircraft or vessel sinking or grounding site?

Scientific Approach and Actions

- Visual inspections of grounding and sinking sites with on-site notes
- Digital photographs and video of impacted and surrounding areas
- Characterization of geology and habitat in disturbed and surrounding areas
- Quantitative transects to determine relative abundance of species occupying primary space
- Integration of work done by marine ecologists directly with salvage teams to enhance data collection
- Follow-up monitoring to determine long-term recovery rates and assess remaining hazards to the marine environment and human uses

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For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>

Key Partners and Information Sources

U.S. Coast Guard, U.S. Fish and Wildlife Service, California Department of Fish and Game Office of Spill Prevention and Response, Moss Landing Marine Laboratories, Monterey Bay Aquarium Research Institute, California State University Monterey Bay Institute for Applied Marine Ecology, local law enforcement agencies, salvage firms

Management Support Products

- Geological maps of disturbed and surrounding areas
- Photographs, video, and survey maps of disturbed and surrounding areas
- Transect data compiled over time to indicate change and/or recovery to biological communities

Planned Use of Products and Actions

- Determination of whether disturbed habitat is unique or sensitive enough to require mitigation
- Mitigation can be informed by knowledge of the likelihood that habitat and biological impacts will be sustained over time
- Development of Sanctuary protocols or a “cookbook” for how to conduct initial damage assessments and long-term monitoring on grounding and sinking sites
- Evaluation of under what circumstances vessel removal will reduce long-term habitat damage
- Informing fishermen and other ocean users of persistent hazards resulting from aircraft and vessels that remain in the marine environment



The F/V Stikine, a 58' purse seiner, sank on January 6, 2012 off Soquel Point with a load of sardines and remains on the seafloor. Photo credit: <http://www.juneautek.com>

Program References

MBNMS Management Plan

- Sanctuary Integrated Monitoring Network (SIMoN) Action Plan, Strategy SI-1, SI-2, SI-4
- Marine Mammal, Seabird, and Turtle Disturbance Action Plan, Strategy MMST-4
- Tidepool Protection Action Plan, Strategy TP-1, TP-7
- Maritime Heritage Action Plan, Strategy XMHR-2, XMHR-3

MBNMS Condition Report

- What are the levels of human activities that may influence habitat quality and how are they changing? (Offshore and Nearshore Environments - Question 8)
- What is the status of biodiversity and how is it changing? (Offshore and Nearshore Environments – Question 9)
- What are the levels of human activities that may influence living resource quality and how are they changing? (Offshore and Nearshore Environments - Question 14)
- Do known maritime archaeological resources pose an environmental hazard and how is this threat changing? (Offshore and Nearshore Environments – Question 16)

ONMS Performance Measures

- Number of sites in which water quality, based on long-term monitoring data, is being maintained or improved
- Number of sites in which habitat, based on long-term monitoring data, is being maintained or improved
- Number of sites in which select living marine resources (LMRs), based on long-term monitoring data, are being maintained or improved

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